

THE NATIONAL POLICE RESEARCH UNIT / TECHSEARCH / 3M AUDIT BAG

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THIS PAPER WILL DISCUSS THE DEVELOPMENT OF A TAMPER-RESISTANT EXHIBIT bag and address the application of 'low end' but still highly effective technology to overcome a perceived problem. The solution involved some plastic, some paper and some glue, plus a lot of lateral thinking.

Genesis/Philosophy— The Drug Exhibit Project

Following a number of Royal Commission findings and media reports concerning drug exhibit handling protocols, the National Police Research Unit (NPRU) was, in 1983, instructed by its Board of Control to examine drug seizure protocols, particularly the practices, procedures and associated hardware utilised from point of seizure to point of destruction.

A senior police officer was seconded as the project's Senior Research Officer and Techsearch Incorporated, the commercial arm of the (then) South Australian Institute of Technology, was commissioned to provide technical support and input.

An examination of current Australian and overseas practices quickly made it clear that an improved exhibit container was required as a fundamental step to improved drug exhibit security.

Options Investigated—Secure Bag/Storage System

A prototype security container was developed by Techsearch in consultation with the NPRU. The container addressed the most important principle of security in terms of minimising the time between actual seizure and first accountability by means of a suitable tell-tale seal to ensure the integrity of the exhibit is maintained along with continuity of the chain of evidence.

Feasibility trials in the field under normal drug squad working conditions were carried out in mid-1984 with the South Australia Police Drug Squad, the Queensland Police and Australian Federal Police Drug Squads in Brisbane, and the Northern Territory Police Drug Enforcement Unit.

The field trials were assessed as an outstanding success not only in terms of the concept of the container, but also for the advantages of an Australia-wide uniform approach to seized drug handling procedures.

At that time, the NPRU also investigated the viability of chemical contamination of drug seizures but this was not pursued due to technical and forensic considerations identified by our technical consultants.

Description of the Audit Bag

Design considerations

The following design considerations were identified following consultation with all Australian police forces.

Identification of container: To reduce the possibility of theft with substitution, each container should be serially numbered and treated as an accountable item. It should not be possible to alter or erase this number without making the change obvious.

Chain of evidence: To preserve and simplify evidence of continuity in handling the exhibit, the container should be openable and resealable by authorised persons. There should be provision for each opening and resealing to be recorded on the container.

Availability of containers to possible users: Seizure of suspect material may be made by any police officer or agent at any time. It should therefore be readily available. The container must therefore be light and self-contained. Any sealing that requires other equipment is undesirable. The need for accountability should not limit the availability of the container.

Immediate sealing at point of seizure: The sealing method should be 'built in' and simple to use. Once closed, it must not be possible to re-open the container without detection.

Security: The material of the container should be heavy enough to be as strong as its closures. It must not be easily punctured by sharp objects inside.

Container construction

With the design considerations in mind, the *Audit Bag* was developed. The bag is constructed of clear PVC with a large pocket in the top for the storage of exhibits, labels etc and a much smaller pocket in the bottom for cross-check label storage.

The top pocket has five adhesive strips to allow for re-opening and resealing by authorised persons. Accordingly, the same bag may be used from time of seizure, through forensic and other examination to final destruction, providing both cost and chain of evidence advantages. Facing each adhesive strip is a printed security strip which bonds strongly to the adhesive.

Security features

Considerable effort and testing has gone into the construction of the five adhesive and printed strips as these provide the principal tamper-resistant capacity of the *Audit Bag*. Once sealed, any attempt to re-open the seal will cause visual degradation and damage to the printed strip. Such damage should be evident to the naked eye thereby providing a simple and effective visual check of exhibit integrity. As will be discussed later in this paper, considerable attention has been paid to confirming the performance of the printed strip against normal and exotic attack; for example, freezing, melting or chemically-induced adhesive breakdown.

It should be stressed that the resealability of the *Audit Bag* relates only to authorised opening and resealing of the bag in relation to the original exhibits placed in the bag. The bag is *not* intended to be used again for other exhibits.

Size

Presently, the *Audit Bag* is only produced in an A4 size, this being identified in 1984 as the optimum single size bag. Operational use of the bag since then, combined with proposals to extend the bag's use into other areas, has illustrated a demand for a variety of bag sizes from A5 to A3.

Cost per unit

In 1991, *Audit Bags* were being sold to police agencies at \$2.05 per unit.

Patent Holders

The National Police Research Unit and Techsearch Incorporated jointly hold patents over the *Audit Bag*.

Manufacturer and marketing

The *Audit Bag* has been produced since the outset by Australian Vinyl of South Australia and marketed by 3M Australia.

Testing of security features and durability

During the development period of the Audit Bag, considerable effort was spent in testing the bag's 'defence mechanisms' to attack, principally to determine if any form of attack could allow the bag to be opened and resealed without visual or forensic detection. These tests, carried out by an independent laboratory not involved with the development of the Audit Bag, assessed the vulnerability of the bag to attack by insertion, cutting, chemical breakdown, freezing in liquid nitrogen and heating.

Preliminary testing revealed a number of weaknesses which were overcome by modifying the pattern and construction of the printed strip which bonded to the adhesive strip. The introduction of a hexagonal pattern to the printing made any access attempt quickly evident. Further, an extra weld was placed between each printed strip to stop insertion of tubes down the edge of the bag. In December 1986, the independent laboratory advised that each previously identified weakness had been successfully overcome.

During evaluations of the Audit Bag prior to implementation in New South Wales, concerns were expressed regarding the strength of the bag for holding sharp, heavy exhibits. To overcome this, the thermal welds of the bag were strengthened and a test protocol devised to conduct quality assurance testing. The test involves placing a 'Brickie's bolster' inside a bag and dropping it one metre to a dead stop. If the bag seams or seals fail, the batch fails. Such testing, whilst severe, does demonstrate the strength of the current specification Audit Bag.

Current usage

The South Australian Police Department has been employing the Audit Bag since early 1987 and reports continuing satisfaction with it. In that time, there has been no reported case of disputed evidence involving the Audit Bag. The New South Wales Police Service commenced issuing the bags in 1990, and in 1991 the Queensland and Victoria Police were undertaking trials.

Advantages of the Audit Bag

Evidence controls improved

The Audit Bag provides a facility whereby exhibits are placed in an accountable, tamper-resistant container at the immediate point of seizure. Upon return to the station, the supervising officer can visually check that the bag has not been tampered with since sealing. If necessary, further checks may be carried out by the supervisor opening the bag by cutting below the first seal, performing whatever checks are necessary (such as counting and weighing), and resealing the bag at the next adhesive strip. The accountable number of the bag and other details are entered in the exhibit receipt book and the exhibit stored or referred for scientific analysis.

Where scientific analysis is conducted, the analyst examines the bag to ensure no tampering since last sealing. If satisfied with the bag's integrity, the analyst opens the bag by cutting below the sealed strip, conducts the analysis and then reseals the bag with the next adhesive strip for return to controlled storage.

Exhibit audits may be conducted visually. Where degradation of the seal or other indicators such as plastic distortion may be evident, the exhibit can be referred for

scientific examination to confirm tampering prior to an internal inquiry being pursued further.

Less disputed evidence

Once evidence is sealed in the Audit Bag, the opportunity for claims of disputed evidence are significantly reduced. The control features surrounding the bag, combined with its inherent 'tell-tale' capacity if tampered with, offer tangible benefits to police administrators.

Of course, claims arising from the initial arrest or seizure point that the amount involved was more, less or 'planted' can only be overcome by ensuring that search, seizure, placement in and sealing of the Audit Bag are conducted, wherever practicable, by two or more officers and in the presence of the offender or suspect.

Whilst not quantifiable at this point, significant cost advantages are seen with the Audit Bag in reducing costs to police agencies in dealing with disputed evidence claims. The quite substantial costs involved in investigating such claims through to the very high cost of defending such claims in court may be reduced by the patent security inherent in the Audit Bag system.

Improving the professional image of policing

Equally, the professional image of the police agency can only be enhanced by presenting to court evidence stored in such a manner that tampering is impossible without being detected and investigated. Such professional 'packaging' must surely offer an improvement over evidence held in containers which are literally or metaphorically 'full of holes'.

Further, the implementation of secure exhibit systems has the potential for substantially removing the opportunity for and allegations of tampering with evidence after seizure. Through such police-initiated measures, the credibility of the profession will be enhanced.

Benefits will also accrue from reduced stress and other problems experienced by police officers facing unnecessary internal investigations or unsubstantiated courtroom allegations of impropriety.

Future Initiatives

Sizes

As mentioned earlier, users of the bags have expressed a desire for both smaller and larger bags in addition to the present A4 size. This demand is related not only to drug exhibits, as the bag is now being used for purposes other than exhibit security, most notably as property bags.

Number of seals

The number of seals required in a practical operational sense is also being constantly reviewed. As the seals represent the most costly production component of the bag, any feasible reduction in number will have tangible cost benefits to jurisdictions.

Bottom pocket

Equally, the NPRU has been advised that the added security intended through the bottom pocket may not be being exploited in practice. The necessity of retaining the bottom pocket is also presently under review.

Further Information

Further information on the Audit Bag may be obtained by contacting:

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